**Measurement & Geometry**

Lecture Notes:

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| **Main Ideas** | **Details** |
| **Measurement Systems** | * US System & Metric system * Mass      * Liquid Capacity      * Length |
| **Measurement Conversion** | * Create a proportion! * Ex: How many cups are in 5 pints? * Ex: How many ounces in 1 ton? * Ex: How many yards in 6 miles? |
| **Formulas** | * Statements of rules connecting variables * There are formulas for all geometric measures * Algebraic equations * To solve a problem using a formula:  1. Plug in the known values for each variable 2. Solve for the unknown variable |
| Geometric Measures | * Perimeter= the distance around an object * Circumference= the perimeter of a circle * Area= the space inside a 2-dimensional object, measured in units squared * Volume= the capacity of a 3-dimensional object, measured in units cubed |
| Parallelograms | * Squares, rectangles, other 4-sided figures with equal lengths and equal heights * Area = base x height [measured in units squared] * Perimeter= base + height + base + height (or 2b + 2h) |
| Triangles | * 3-sided figures * Area= ½b x h [measured in units squared] * Perimeter= length of side a + length of side b + length of side c |
| Circles | * Area= π r2   (r = radius = ½ the diameter of a circle)   * Circumference= 2 π r |
| Trapezoids | * Area= ½ h (a+b) |
| Volume | * Volume rectangular prism= lwh * Volume pyramid= (1/3)(area of base)(h) * Volume sphere= (4/3) π r3 |

**Statistics and Probability**

Lecture Notes:

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| **Main Ideas** | **Details** |
| **Descriptive Statistics** | * **Data:** Values in a set * **Discrete data:** clear cut scores   Ex: (1, 2, 3)   * **Interval data:** Grouped data   Ex: 1-3, 4-6, 7-9   * **Frequency Distribution:**      * **Relative frequency:** The percentage of the whole that the frequency represents   To compute relative frequency:   1. Divide each score’s frequency by the total number of scores 2. The answer is decimal or percent   Ex: Find the relative frequency of each score from the frequency distribution above   * **Frequency polygon:** A coordinate plane with x axis representing score and y axis representing frequency. A line graph connects all the points.   Ex: Use the data from the frequency distribution above to create a frequency polygon   * **Frequency histogram:** A coordinate plane with x axis representing score and y axis representing frequency. Bar graphs demonstrate the frequency of each score * **Circle/pie graph:** Pieces of the circle/pie represent the proportion of the frequency for each score   Ex: Create a circle graph with the data from the frequency distribution above |
| Measures of Central Tendency | * In statistics, there are many measures to tell how data clusters near the center of data, such as mean, median, mode, range, and weighted mean * **Mean:** numerical average   To find the mean:   1. Add all the scores (elements of the data set) 2. Divide by the total number of scores.   Ex: Scores= (81, 85, 82, 89, 83)   * **Median:** the number directly in the middle of the data   To find the median:   1. Arrange the scores in numerical order 2. Find the score directly in the middle 3. If there are two scores in the middle, find the mean of those two scores. That is the median.   Ex: Scores= (81, 85, 82, 89, 83)   * **Mode:** The score that occurs the most often   If there are two modes, the data set is considered bimodal.  Ex: Scores= (13, 8, 8, 7)   * **Range:** high score minus the low score   Ex: (1, 2, 3, 4, 5)   * **Weighted Mean:** similar to an [arithmetic mean](http://en.wikipedia.org/wiki/Arithmetic_mean) (see above) where instead of each of the data points contributing equally to the final average, some data points contribute more than others   To find the weighted mean:   1. Multiply each score by its weight 2. Add the results   Ex:  Grades are often computed using a weighted average. Suppose that homework counts 10%, quizzes 20%, and tests 70%.  If Pat has a homework grade of 92, a quiz grade of 68, and a test grade of 81, then  Pat's overall grade = (0.10)(92) + (0.20)(68) + (0.70)(81)             = 79.5 |
| Probability | * **P=** number of successes divided by total number of possibilities   Ex: What is the probability of rolling a “5”?   * **Probability of an event NOT happening=** 1 minus the probability of the event happening   Ex: What is the probability of NOT rolling a “5”? |